# 5 Elements Necessary for Recovery



The FGC identifies three elements necessary to achieve the goals of the Recovery Strategy: a) availability and use of public lands for the conservation, protection, restoration, and enhancement of the species; b) methods of public and private cooperation[1]; and c) procedures and programs for notice, education, research, monitoring, and strategy modification. An additional element is the regulatory role in recovery. These elements are discussed in the following sections. Strategy management and modification are discussed in Chapter 12.

## 5.1 ROLE OF PUBLIC LANDS

The range of coho salmon in California is predominantly under private ownership (63%). Public lands encompass the remaining 37% of the species' range, or approximately 8,125 square miles. Approximately 4,375 square miles of these public lands are located within watersheds where coho salmon have been identified as consistently present (Figures 5-1 and 5-2).

Coho salmon recovery is dependent upon the role of private lands, by virtue of the extent of private lands within the range of the species. The Recovery Strategy seeks to achieve species conservation in ways which are consistent with private property rights. Recovery efforts must incorporate maximum use of existing public lands to approach recovery objectives. It is incumbent on the Department to coordinate with other public agencies to promote and implement coho salmon recovery goals and actions on public lands. Below is a summary of the responsibilities of various Federal, State, and local governments.

### 5.1.1 FEDERAL LANDS

Federal lands within the range of the coho salmon are administered by the U.S. Forest Service (USFS), National Park Service (NPS), Bureau of Land Management (BLM), Department of Defense (DOD), USFWS, Department of Energy, and Bureau of Reclamation (USBR). Under sections 7(a)(1) and 7(a)(2) of the ESA, Federal agencies shall carry out their programs for the conservation of endangered and threatened species and ensure their actions, authorizations, and funding are not likely to jeopardize their continued existence or adversely modify their critical habitat.

#### 5.1.1.1 U.S. Forest Service

USFS lands encompass approximately 6,563 square miles and include the Klamath, Mendocino, Shasta-Trinity, and Six Rivers National forests. These lands represent 81% of the public lands in the SONCC Coho ESU and play a key role in the recovery of coho salmon.

Congress has directed the USFS to manage national forests for multiple uses and benefits, including protection and management of natural resources, forestry and range land management and research, and community assistance and cooperation with State and local govern-

[1] The Department has identified watershed programs, groups, and other resources currently involved in making watershed improvements that may benefit salmonids. Details about this effort are in Appendix E: Watershed Groups and Gap Analysis.

ments. All Forest programs, activities, and projects are reviewed for possible effects on endangered and threatened species, species proposed for listing, and sensitive species. The purpose of the reviews is to ensure that USFS actions do not contribute to the loss of viability for any native or desired non-native plant or animal, and to comply with the ESA.

The USFS has developed an Aquatic Conservation Strategy, a fundamental component of the Northwest Forest Plan (USDA Forest Service 1997), to restore and maintain the ecological health of watersheds and aquatic ecosystems contained within them on public lands. The strategy was developed to protect salmon and steelhead habitat on Federal lands managed by the USFS and BLM within the range of Pacific Ocean anadromy. This conservation strategy uses several methods to further the goal of maintaining a "natural" disturbance regime.

#### 5.1.1.2 U.S. Bureau of Land Management

BLM lands encompass approximately 516 square miles and include the Headwaters Forest Reserve and the Kings Range Conservation Area.

The Headwaters Forest Reserve is co-managed by the BLM and the State of California to protect the stands of old-growth redwoods that provide habitat for the Federal and State threatened marbled murrelet, and the headwaters that serve as habitat for the coho salmon and other fisheries.

The BLM is responsible for managing the nation's public lands and resources in a combination of ways that balance recreational, commercial, scientific, and cultural interests (i.e., multiple use) and strives for sustained yields of renewable and non-renewable resources, including range, timber, minerals, recreation, watershed, fish and wildlife habitat, wilderness and natural, scenic, and cultural values. The BLM manages the use of these lands to ensure that, wherever possible, the burden of conserving fish, wildlife, and plant species falls on the public lands and not on adjacent private lands.

The BLM administers public lands within a framework of numerous laws. The most comprehensive of these is the Federal Land Policy and Management Act of 1976 (FLPMA). All Bureau policies, procedures and management actions must be consistent with FLPMA and the other laws that govern use of the public lands, including the ESA.

#### 5.1.1.3 U. S. National Park Service

NPS lands encompass approximately 249 square miles and include Redwood National Park, Point Reyes National Seashore, Muir Woods National Monument, and Golden Gate National Recreation Area.

The purpose of the NPS is "...to conserve the scenery and the natural and historic objects and the wildlife therein and to provide for the enjoyment of future generations" (16 USC 1:1916). This mandate is combined with the NPS mission and responsibilities as a Federal agency to protect, conserve, and contribute to the recovery of candidate, threatened, endangered species.

#### 5.1.1.4 U. S. Department of Defense

DOD lands encompass approximately 86.8 square miles and include various military facilities, the majority of which are located in the San Francisco Bay Area.

The Sikes Act authorizes the DOD to manage natural resources on military lands, and 1997 amendments to the Act provide many opportunities for the DOD to enhance its management. All military installations with significant natural resources are required to develop and implement Integrated Natural Resources Management Plans in cooperation with the USFWS and the appropriate state wildlife agency.

**FIGURE 5-1:** Land ownership in the SONCC Coho ESU

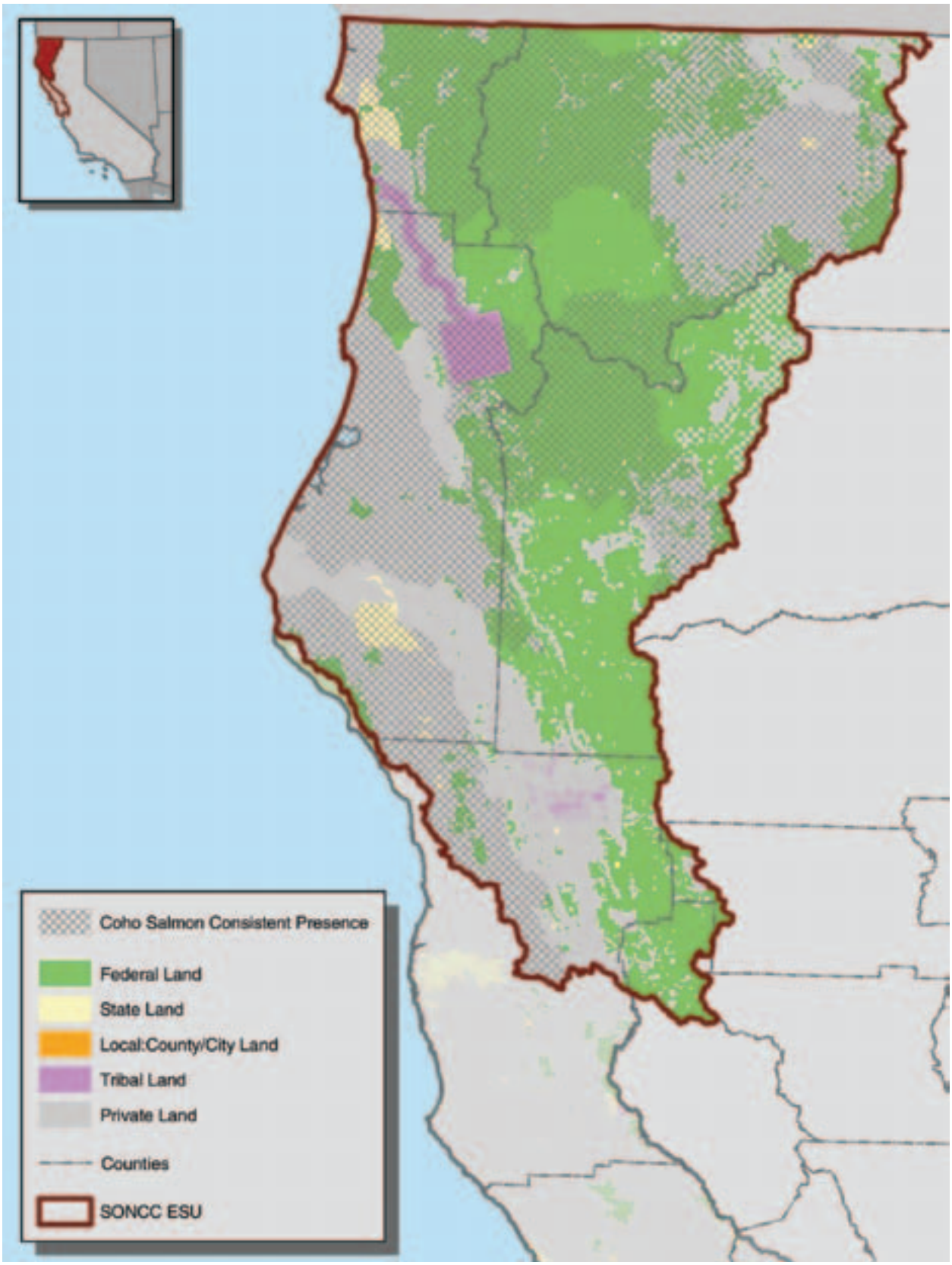

**FIGURE 5-2:** Land ownership in the CCC Coho ESU

The U. S. Army Corps of Engineers (USACE), which is under the DOD, operates two reservoirs within the range of coho salmon, Lake Mendocino and Lake Sonoma, that are both in the Russian River basin. The USACE also owns, and funds Department operation of, the Don Clausen Hatchery at Lake Sonoma.

#### 5.1.1.5 U.S. Fish and Wildlife Service

USFWS lands encompass 32.0 square miles and include Humboldt Bay National Wildlife Refuge on the north coast and San Pablo Bay, Marin Islands, and Don Edwards San Francisco Bay National Wildlife Refuges in the San Francisco Bay Area.

The USFWS is charged with protecting endangered and threatened species under their jurisdiction and restoring them to a secure status in the wild. Responsibilities of the USFWS Endangered Species program include listing, reclassifying, and delisting species under the ESA; providing biological opinions to Federal agencies on their activities that may affect listed species; overseeing recovery actions; providing for the protection of important habitats in National Wildlife Refuges; providing grants to states to assist with their endangered species conservation programs; and international coordination.

#### 5.1.1.6 U.S. Bureau of Reclamation

USBR lands encompass approximately 0.45 square miles in Siskiyou County and include the Klamath and Trinity River Projects in the range of the SONCC Coho ESU. The mission of the USBR is to manage, develop, and protect water and related resources in an environmentally and economically sound manner in the interest of the American public. USBR facilities are managed to fulfill water user contracts and protect and enhance conditions for fish, wildlife, land, and cultural resources.

### 5.1.2 STATE LANDS

The State of California administers approximately 550 square miles of public lands within the range of coho salmon, including lands managed by the Department of Parks and Recreation (DPR), Department of Forestry and Fire Protection (CDF), State Lands Commission (SLC), and the Department.

#### 5.1.2.1 California Department of Parks and Recreation

DPR lands encompass approximately 420 square miles and include more than 270 park units within the range of the coho salmon. DPR lands are managed to provide for the health, inspiration, and education of the people of California, by helping to preserve the State's extraordinary biological diversity, protecting its most valued natural and cultural resources, and creating opportunities for high-quality outdoor recreation.

#### 5.1.2.2 California Department of Forestry and Fire Protection

CDF lands encompass 79.6 square miles and include the Jackson and Soquel Demonstration State Forests. CDF's responsibilities are to protect the people of California from fires; respond to emergencies; and protect and enhances forest, range, and watershed values providing social, economic, and environmental benefits to rural and urban citizens. CDF's mission emphasizes the management and protection of California's natural resources; a goal that is accomplished through ongoing assessment and study of the State's natural resources and an extensive CDF Resource Management Program. CDF oversees enforcement of the Forest Practice Rules (FPRs), which regulate timber harvesting on private lands.

CDF manages demonstration State forests for commercial timber production, public recreation, and research and demonstration of good forest management practices. Jackson

Demonstration State Forest is managed to prevent "take" of listed species, and to allow aquatic habitat recovery to proceed. Target species include the coho salmon.

#### 5.1.2.3 California State Lands Commission

SLC lands encompass approximately 42.6 square miles located in approximately 54 areas, ranging in size from six to 1,559 acres. They are distributed throughout the coho salmon range. The SLC serves the people of California by providing stewardship of the lands, waterways, and resources entrusted to its care through economic development, protection, preservation, and restoration. The SLC has primary responsibility for the surface management of all sovereign and school lands in California. This responsibility includes the identification, location, and evaluation of the State's interest in these lands and its leasing and management.

Public and private entities may apply to the SLC for leases or permits on State lands for many purposes including marinas, industrial wharves, dredging, sand mining, tanker anchorages, grazing, rights-of-way, bank protection, recreational uses, etc. SLC staff review such applications and make recommendations to the SLC for action.

#### 5.1.2.4 California Department of Fish and Game

Lands owned and/or managed by the Department encompass more than 7.8 square miles and include approximately 150 designated wildlife areas, ecological reserves, conservation easements, and fishing accesses.

The Department is the State agency charged with protecting and managing California's fish, wildlife, and their habitats. Department lands designated as wildlife areas are managed to protect and enhance habitat for wildlife species, and to provide the public with wildlife-related recreational uses. These lands provide habitat for a wide array of plant and animal species, including many listed as threatened or endangered. In contrast, Department lands designated as ecological reserves are managed to provide habitat for threatened or endangered species or species of special concern.

### 5.1.3 COUNTY AND CITY LANDS

Local government lands total approximately 105 square miles within the range of coho salmon. Local governments set forth the obligations of local projects, both public and private.

## 5.2 FUNDING FOR PRIVATE AND PUBLIC COOPERATION

Voluntary cooperation between private and public sectors is a critical aspect of coho salmon recovery, because political boundaries and property lines have no bearing on coho salmon occurrence. Private lands comprise approximately 63% of the total land within the range of the coho salmon. Approximately 36% of all lands in coho salmon range are private agricultural and forested lands. Cooperative efforts to maintain and restore coho salmon habitat on private land are usually more effective in watersheds where there are large contiguous parcels of forest and agricultural lands, in comparison to watersheds with multiple small ownerships and a relatively high human population density. This is only one of the benefits of having productive resource and community-based landowners maintaining lands in a contiguous and open landscape.

The Department supports economically and environmentally sustainable management of forest and agricultural lands in the range of coho salmon to reduce the potential for conversion to residential or commercial development. In particular, the timely and effective recovery of coho salmon on private lands should include programs to provide appropriate technical and financial assistance to landowners. At present many groups and programs exist to facilitate

landowner outreach, education, planning, funding, and implementation of actions aimed at protecting and improving habitat for anadromous salmonids. The CRT report to the Director presented a partial list of voluntary and cooperating groups and activities focused on recovery of coho salmon by watershed.

### 5.2.1 EXISTING PROGRAMS

A diverse array of existing State and Federal funding programs is available to local watershed groups, individual landowners, and other stakeholders to assist in addressing the needs of California's watersheds. For example, grant programs administered by the Department, local Resource Conservation Districts (RCDs), the SWRCB, NOAA Fisheries, and numerous other groups provide assistance for fish habitat enhancement and water quality improvement projects that are consistent with coho salmon habitat recovery needs. It is extremely important that these grant programs continue to be funded to foster existing partnerships and to restore habitat.

#### 5.2.1.1 Fisheries Restoration Grants Program

The Fisheries Restoration Grants Program (FRGP) is the Department's primary program for funding fisheries improvement projects, education, organizational support and planning in salmon and steelhead watersheds and streams. Public agencies, non-profit organizations, tribes and private entities living and working in watersheds from the Oregon border to the Mexican border are receiving grants to restore salmon and steelhead populations.

Funds for the FRGP come from the Salmon and Steelhead Trout Restoration Account (Proposition 40), Commercial Salmon Stamp Account, Steelhead Catch-Restoration Card sales, and Proposition 13. Additional funding comes from the Federal Pacific Coastal Salmon Recovery Fund, a six-year program established at the request of the governors of the states of California, Oregon, Washington, and Alaska, with the support of the California Congressional Delegation, in the Fiscal Year 2000 Consolidated Appropriation Act Public Law 106-113. This Federal funding is administered through the FRGP in accordance with a Memorandum of Understanding among the California Resources Agency (Resources Agency), the Department, and NOAA Fisheries.

Types of projects eligible for funding by the Fishery Restoration Grants Program include:

- Instream habitat restoration, bank stabilization, barrier modification;
- Fish ladders and screening of diversions;
- Watershed restoration (upslope);
- Riparian restoration;
- Watershed evaluation, assessment, and planning;
- Conservation easements for riparian buffer strips;
- Project maintenance;
- Watershed organization support;
- Education and technical training;
- Project monitoring for completed projects;
- Monitoring to provide baseline and/or trend data;
- Cooperative rearing;
- Water conservation measures; and
- Water measuring devices.

The FRGP is an applicant proposal-driven process. The Department solicits proposals for projects annually. The proposals are evaluated by Department staff. Projects are scored based on several factors, including their merit, the number of anadromous salmonid species benefited, and if those species are endangered, threatened, or candidate species under ESA or CESA. The proposals and staff evaluations are then provided to the California Coastal Salmonid Peer Review Committee, whose members include representatives of county governments, sport and commercial fisheries, Tribal governments, agriculture, forestry, public water agencies, and the academic and research community. The peer review committee considers the proposals and makes funding recommendations to the Director, who makes the final funding decisions.

The FRGP has been in place since 1981 and has invested more than $120 million, supported more than 2000 projects, involved more than 600 partners, and worked in over 2500 coastal streams. Annual funding in the program is currently in the $20 million range.

#### 5.2.1.2 California Department of Conservation Grant Program

Through its Division of Land Resource Protection (DLRP), the Department of Conservation (DOC) plays a major role in protecting California's farmland, open space, and related resources. Financial assistance is offered to local governments and landowners for farmland and open space protection through programs that provide:

- Property tax incentives for retaining agricultural and open space land uses;
- Grants for the purchase of agricultural conservation easements; and
- Funding for conservation projects conducted by RCDs.

DOC's RCD grant program provides financial assistance, administrative education through California Conservation Partnership training programs, and information and technical support through the department's publications and technical assistance program. Additional financial assistance is offered through competitive conservation project grants to RCDs and technical assistance is offered in the form of liaison services, training, and outreach efforts.

#### 5.2.1.3 Environmental Enhancement and Mitigation Program

The Environmental Enhancement and Mitigation Program offers a total of $10 million each year for grants to local, State, and Federal government agencies and to non-profit organizations for projects to mitigate the environmental impacts caused by new or modified State transportation facilities. Individual grants are usually limited to $250,000. State gasoline tax monies fund the Environmental Enhancement and Mitigation Program. Grants are awarded in three categories:

- *Highway Landscape and Urban Forestry:* Projects designed to improve air quality through the planting of trees and other suitable plants;
- *Resource Lands:* Projects for the acquisition, restoration, or enhancement of watersheds, wildlife habitat, wetlands, forests, or other natural areas; and
- *Roadside Recreational:* Projects for the acquisition and/or development of roadside recreational opportunities.

Program Procedures and Criteria, including specific application dates and funding limits, are generally published by the Resources Agency each year in September. The Resources Agency evaluates project proposals and provides a list of recommended projects to the California Transportation Commission by April 15th each year for consideration. The California Department of Transportation (Caltrans) administers the approved grant agreements.

#### 5.2.1.4 Department of Water Resources Grant Program

The Department of Water Resources (DWR) administers grant and loan funding associated with legislation and several general obligation bond laws. Grant and loan funding may be provided for local studies, programs, and projects to better manage California's water resources. These funds are being made available for water conservation and groundwater management purposes through the:

- Safe Drinking Water, Clean Water, Watershed Protection, and Flood Protection Bond Act (Proposition 13);
- Local Water Supply loan program authorized under the Water Conservation Bond Law of 1988 (Proposition 82); and
- Local Groundwater Management Assistance Act of 2000 (AB 303).

#### 5.2.1.5 California Coastal Conservancy Program

The California Coastal Conservancy works with local governments, other public agencies, nonprofit organizations, and private landowners to purchase, protect, restore, and enhance coastal resources, and to provide access to the shore. The California Coastal Conservancy has a current annual budget of over $185 million and since 1975, has invested well over $500 million to complete its projects, and has been funded primarily by State general obligation bonds and from the State's general fund. To date, the Coastal Conservancy has undertaken more than 950 projects along the 1,100 mile California coastline and around San Francisco Bay. Coastal Conservancy projects include the following:

- Land acquisition;
- Public access;
- Resource restoration;
- Resource enhancement;
- Urban waterfront improvement and restoration;
- Land use conservation and site reservation;
- Agricultural land preservation; and
- Non-profit support.

#### 5.2.1.6 Watershed and Nonpoint Source Pollution Control Programs

Watershed/Nonpoint Source grants are offered through the SWRCB Division of Financial Assistance, in partnership with CALFED, the EPA, the California Coastal Commission, and the Resources Agency. These grants are made available through funding from Proposition 13, the Federal Clean Water Act section 319, and Proposition 50. Although the specific focus area of some of these programs are outside the range of coho salmon, other programs to improve water quality within the range of coho salmon, especially projects to reduce fine sediment input to streams, will be important for coho salmon recovery.

*Nonpoint Source Pollution Control Program* (Water Code, Division 25, Chapter 7, Article 2) (Proposition 13): The Nonpoint Source Pollution Control Program provides grant funding to local public agencies and nonprofit organizations formed by landowners for projects that protect the beneficial uses of water throughout the State through the control of nonpoint source pollution.

*Coastal Nonpoint Source Pollution Control Program* (Water Code, Division 25, Chapter 7, Article 5) (Proposition 13): The program provides grants to municipalities, local public agencies, nonprofit organizations, and educational institutions for coastal nonpoint source projects that

restore and protect the water quality and environment of coastal waters, estuaries, bays, and near shore waters and groundwater.

N*onpoint Source Implementation Program* (Federal Clean Water Act §319): The 319 Nonpoint Source Implementation Program provides grant funding for projects to implement measures and practices that reduce or prevent nonpoint source pollution to ground and surface waters. In particular, proposals that implement measures to achieve pollutant load reductions and address TMDL implementation are favored in the selection process. Grants are available to municipalities, local public agencies, educational institutions, nonprofit organizations or tribes. Funds cannot be used for activities undertaken pursuant to a NPDES permit (including stormwater).

*CALFED Drinking Water Quality Program* (Propositions 13 and 50): The Drinking Water Quality Program is focused on improving the quality of Central Valley and Delta water sources used for drinking water. Thus, projects eligible for Drinking Water Quality Program funding will generally be located in the watersheds of the Central Valley Regional Board (Region 5). Projects funded through Proposition 13 must meet the minimum requirements of both the Proposition 13 Nonpoint Source Pollution Control Program and the DWQP, whereas projects funded through Proposition 50 only need to meet the requirements of the Drinking Water Quality Program.

*Watershed Protection Program* (Water Code, Division 25, Chapter 5, Article 2) (Proposition 13): Grants are available to municipalities, local agencies, or nonprofit organizations to develop and implement local watershed management plans to reduce flooding, control erosion, improve water quality, and improve aquatic and terrestrial species habitats.

*CALFED Watershed Program* (Propositions 13 and 50): The Watershed Program will support activities that provide benefits to the areas within the CALFED Solution Area. Projects funded through the Proposition 13 allocation must meet the minimum requirements of both the Proposition 13 Watershed Protection and the CALFED Watershed Programs, whereas projects funded through Proposition 50 only need to meet the requirements of the CALFED Watershed Program.

#### 5.2.1.7 Farm Bill Grants

The Farm Security and Rural Investment Act of 2002 (Farm Bill) authorizes $180 billion over seven years, including more than $17 billion for programs to assist landowners protect soil, water, and air quality; support fish and wildlife habitat conservation; purchase conservation easements for agricultural and wildlife purposes; and support improved forest management on non-industrial forestlands. While funding is subject to annual appropriations, Farm Bill grants have the potential to significantly benefit coho salmon. Within the range of coho salmon in California, the various Farm Bill programs allocated $5.45 million in 2002 and $9.60 million in 2003.

The Natural Resources Conservation Service (NRCS) is responsible for providing technical and financial assistance to implement conservation programs in the Farm Bill. In recent years, the Department and other State agencies have played a key partnership role with the NRCS to expand and encourage private land conservation efforts throughout California. Through this working relationship, the ability to leverage Federal and State resources on a landscape level can help facilitate coho salmon recovery efforts. With the active participation and cooperation of RCDs, rural landowners can take advantage of the diverse conservation programs available through the Farm Bill.

Key watershed conservation programs available in the Farm Bill through the NRCS include the following:

*Environmental Quality Incentives Program (EQIP):* EQIP promotes agricultural production and environmental quality as compatible goals. Through this voluntary program, farmers and ranchers may receive financial and technical help to install or implement structural and management conservation practices on their land. Cost sharing (up to 75 %) or incentive payments can be provided for a wide range of practices, including nutrient management, livestock waste handling, conservation tillage, terraces, and filter strips. EQIP is unique among farm conservation programs in its heavy focus on livestock producers.

Nationwide, EQIP is slated to receive $5.8 billion in funding for fiscal years (FY) 2002-07 and a total of $9 billion over ten years. Funding is phased up to $1.3 billion annually by FY 2007, compared with annual funding of roughly $200 million per year under the 1996 Farm Act.

EQIP's focus is on livestock producers, with 60% of funding earmarked for these producers, up from 50% in the 1996 Farm Act. Limits on the size of participating livestock operations, which excluded operations with more than 1,000 animal units, are eliminated in the 2002 Act. Payments are limited to a total of $450,000 per operation over the six-year life of the Act. Participating livestock operations are required to develop a comprehensive nutrient management plan.

Funding for conservation on working agricultural land is increasing relative to funding for land retirement. Because past conservation funding focused on land retirement, increased funding for working land constitutes a significant change in overall conservation program emphasis. EQIP and the newly initiated CSP are slated to receive new funding of $11 billion over ten years. The Congressional Budget Office estimates that increasing Conservation Reserve Program (CRP) and Wetlands Reserve Program (WRP) acreage caps will increase land retirement spending by $3 billion over the same period (from the April 2002 baseline). Expansion of working land programs will make a broader array of conservation options available to a larger group of producers. The increase in the number of programs available may provide the flexibility needed to develop conservation systems that deliver environmental gains at the lowest possible cost.

Changes in EQIP bid assessment procedures, however, may reduce the overall level of environmental benefit per dollar of program expenditure. Although "optimization of environmental benefits" is cited as a purpose of the program, the requirement to maximize environmental benefits per dollar of program expenditure is eliminated. Eliminating priority areas will make it more difficult to target EQIP funds to areas with the greatest environmental need. The ability of producers to enhance prospects for enrollment and reduce program cost by lowering bids (bidding down) is eliminated, increasing the cost of some contracts.

*Wetland Reserves Program:* WRP restores wetland, upland and riparian complexes to improve habitat for migratory birds. The objectives of this program are to purchase conservation easements from willing sellers, restore and protect wetlands in agricultural settings, and assist landowners with the restoration of wetland hydrology to enhance fish and wildlife habitat.

*Conservation Reserve Program:* Established in its current form in 1985 and administered by USDA's Farm Services Agency, CRP provides farm owners or operators with an annual per-acre rental payment and half the cost of establishing a permanent land cover, in exchange for retiring environmentally sensitive cropland from production for ten to 15 years. In 1996, Congress re-authorized CRP for an additional round of contracts, limiting enrollment to 36.4 million acres (56,875 square miles) at any time. The 2002 Farm Act increased the enrollment limit to 39 million acres (60,938 square miles). Producers can offer land for competitive bidding based on an Environmental Benefits Index during periodic signups, or can automatically enroll more limited acreages in practices such as riparian buffers, field windbreaks, and grass strips on a continuous basis. CRP is funded through the Commodity Credit Corporation.

To participate in the CRP, producers submit bids that specify practices to be used (e.g., grass, trees, wildlife habitat, filter strips) and the annual rental payment and cost sharing they are willing to accept for establishing these practices. Bids are ranked for selection using the Environmental Benefits Index, which incorporates six environmental factors (including soil erosion, water quality, and wildlife habitat) and contract cost. Contracts are for ten to 15 years.

In addition to the opportunity to enroll in the CRP under the general competitive signups, producers may bypass the competitive bid process and enroll acreage in specific conservation practices under the continuous CRP signup. These practices include:

- Filter strips;
- Riparian buffers;
- Shelter belts;
- Living snow fences;
- Field windbreaks;
- Grass waterways;
- Salt-tolerant vegetation; and
- Shallow water areas for wildlife.

Competitive bidding is not used since the relatively small acreage devoted to one of these practices provides a positive environmental impact for a much larger area. Hence, if the applicant is willing to accept no more than a set per-acre payment for an eligible practice on eligible land, acceptance is automatic and is possible year-round. Payments include a 20% incentive over the Commodity Credit Corporation's maximum rental rates for field windbreaks, grass waterways, filter strips, and riparian buffers, and a 10% incentive for land located within EPA-designated wellhead protection areas. In addition to the enhanced rental rates, 50% cost-sharing and a per-acre maintenance payment are provided.

In April 2000, USDA announced enhanced incentives for continuous signup participation. These include:

- A signing incentive payment of $100 to $150 per acre (depending on the length of contract) for filter strips, riparian buffers, grassed waterways, field windbreaks, shelter belts, and living snow fences;
- A practice incentive payment equal to 40% of cost-sharing for all continuous signup practices;
- Increased maintenance payments for certain practices;
- Updated marginal pastureland rental rates to better reflect the market value of such lands; and
- As of October 2001, about 1.5 million acres (2,343 square miles) had been enrolled in the continuous signup, with filter strips, vegetation to reduce salinity, and riparian buffers as the principal conservation practices. About half of the acreage is enrolled in the Midwest.

*Wildlife Habitat Incentives Program:* Encourages the voluntary establishment of high quality wildlife habitat on private lands. While some NRCS programs are specifically designed for agricultural lands, the Wildlife Habitat Incentives Program offers technical and financial help for all private landowners or local units of government who wish to plan and develop upland, wetland, riparian, or aquatic habitat on their property.

*Farmland Protection Program:* Helps farmers keep their productive land in agriculture. This program assists states, tribes, local governments and non-profit organizations by purchasing conservation easements for the purpose of limiting land conversion to non-agricultural uses.

*Resource Conservation and Development Program:* Assists communities to care for and protect their natural resources in a way that will improve the area's economy, environment and living standards. It provides a way for community members to initiate, sponsor, plan and implement projects that will make their area a better place to live.

*Emergency Watershed Protection Program:* Provides technical and financial assistance for watersheds ravaged by natural disasters. This program provides funding for work such as clearing debris from clogged waterways, restoring vegetation, and stabilizing riverbanks.

*Conservation Technical Assistance:* Provides technical assistance to voluntary participants interested in planning and carrying out conservation activities to address local natural resource issues. NRCS staff works with land-users and communities to provide resource solutions throughout the watershed. Conservation Technical Assistance provides the science-based technical assistance needed to create long-term resource solutions at the local level.

*Conservation Security Program:* The newly created Conservation Security Program will provide payments to producers for maintaining or adopting structural and/or land management practices that address a wide range of local and/or national resource concerns. As with EQIP, a wide range of practices can be subsidized. But the Conservation Security Program will focus on land-based practices and specifically excludes livestock waste-handling facilities. Producers can participate at one of three tiers; higher tiers require greater conservation effort and offer higher payments. The lowest cost practices that meet conservation standards must be used. By paying producers to maintain practices they have previously found to be profitable to undertake, Conservation Security Program payments are not necessarily intended to internalize environmental externalities but are certainly intended to support agricultural incomes.

#### 5.2.1.8 NOAA Community-based Restoration Program

The Community-based Restoration Program's objective is to bring together citizen groups, public and nonprofit organizations, industry, corporations and businesses, youth conservation corps, students, landowners, and local government, State and Federal agencies to restore fishery habitat around the coastal U.S. The program funds projects directly, and through partnerships with national and regional organizations. Since 1996, the Community-based Restoration Program has funded over 600 restoration projects and has developed national and regional Habitat Restoration Partnerships with 19 organizations. NOAA Community-based Restoration Program has two direct Federal funding opportunities.

*NOAA Community-based Restoration Program Individual Project Grants:* The Community-based Restoration Program provides funds for individual grass-roots marine habitat restoration projects that will benefit living marine resources including anadromous fish species, commercial and recreational resources, and endangered and threatened species.

*NOAA Community-based Habitat Restoration National and Regional Partnership Grants*: Partnerships are a key element in community efforts to accomplish significant, on-the ground habitat restoration. Partnerships have significantly leveraged available NOAA funds through cash match and local contributions, including land, volunteer support, and other in-kind services such as technical assistance, earthmoving activities and local knowledge.

NOAA also has a community-based restoration partnership program that periodically announces funding opportunities throughout the year. The funding for these programs are matching funds.

#### 5.2.1.9 A Targeted Incentive Program

For other habitat conservation efforts, State and Federal agencies have created special ventures to provide recovery incentives for Californians. For example, the Central Valley Habitat Joint Venture funds habitat acquisition, conservation easements and management agreements with landowners. The State also purchases easements through the Wetland Easement program and the California Waterfowl Habitat Program. A similar program could be developed for coho salmon recovery.

Another instrument that could be used to create incentives for coho salmon habitat restoration if funds were available would be a tax incentive program. For example, Oregon has a property tax credit available to land owners who maintain riparian buffers. Expanding this tax credit was an element of that State's coho salmon recovery program. A government agency could announce a tax credit that would be available to all landowners undertaking a particular set of conservation activities, perhaps indexed to account for the fact that activities in some watersheds are more valuable than in others. This would relieve some of the informational burden of ranking bids that exists in programs like the Community-based Restoration Program, and transfer risk to the private landowner. Landowners undertake activities before receiving compensation from the government in this scenario.

Incentives might also be provided to public stakeholders. The Oregon conservation plan provides bonuses to local governments that meet or exceed salmon restoration performance standards (State of Oregon 1997).

#### 5.2.1.10 Other Programs

There are a variety of other grant programs that may be available to contribute to coho salmon recovery, including programs administered by NOAA Fisheries and other groups.

### 5.2.2 MINIMIZING SOCIAL AND ECONOMIC IMPACTS

Solutions to recover coho salmon will be determined and accomplished locally. A guiding principle must be cooperation and coordination to promote partnerships. Landowners must have opportunities available to them that provide flexibility as well as assurances that voluntary participation in coho salmon recovery programs will not create significant new burdens in their use of their land. A balance of options will foster greater cooperation and promote innovation. Solutions will be ecosystem-based and will provide equitable problem-solving at the watershed scale in a comprehensive manner.

### 5.2.3 VOLUNTARY INCENTIVES

An incentives-based approach will be critical to the success of a timely and effective coho salmon recovery. The voluntary commitment of landowner resources and time that are part of cooperative and incentives-based programs also helps to leverage public funds available for recovery.

This Recovery Strategy contains a description of actions and recommendations, including voluntary incentives and objective criteria for delisting to minimize the adverse social and economic impacts of implementation of the Recovery Strategy. Chapter 4 describes the objective criteria for delisting. Chapters 9 and 10 contain implementation schedules that detail actions and recommendations including voluntary incentives, actions, and programs.

## 5.3 OUTREACH AND EDUCATION

The awareness and cooperation of public and private landowners, conservation groups, planning agencies, stakeholders, and the general public is essential for coho salmon recovery. Outreach and educational programs detailing the life history and habitat requirements of the species, as well as the goals and objectives for recovery, are an important part of this Recovery Strategy.

The Department will develop and implement educational initiatives or products to complement the biological recovery efforts proposed in this document. Development, prioritization and, ultimately, implementation of these initiatives are dependent on the availability of human and financial resources. The Department will utilize and build upon existing Department educational programs, such as the Mobile Fish Exhibit, Fishing in the City, Project Wild Aquatic, and the Elkhorn Slough National Estuarine Research Reserve. The Mobile Fish Exhibit in the Department's Central Coast Region is uniquely suited to bringing the message of coho salmon recovery to citizens groups and other stakeholders.

### 5.3.1 RECOVERY STRATEGY RECOMMENDATIONS

Priority will be given to educational activities that help to implement specific range-wide and regional coho salmon recovery recommendations with educational components, including recommendations that focus on water flow and conservation, water quality, sediments, land use, public outreach, and enforcement.

### 5.3.2 EDUCATION AND OUTREACH PLAN

The Department has a plan for education and outreach that focuses on providing notice to the public about the Recovery Strategy as well as information to interested and affected entities about coho salmon biology, definition and goals of recovery, and how recovery can be achieved. It includes elements outlined in this section below. Public and private landowners will be familiarized with coho salmon and their habitat occurring on their land, significance of the populations, and available conservation measures, including private land incentive programs.

For private lands with potential occurrences of coho salmon (i.e., lands with historic occurrences or otherwise within the range of the species), permission will be sought from landowners to conduct surveys or other recovery activities requiring access to coho salmon habitat. If populations of salmon are identified, landowners will be informed of their significance and encouraged to follow land use guidelines that protect the species and its habitat.

#### 5.3.2.1 School Curricula

The Department will develop and disseminate educational materials for use in public and private schools. These materials would include concepts of coho salmon biology, endangered species, habitat conservation and restoration, and coho salmon recovery efforts in California.

Educational materials should be compatible with current California Science Standards. Grade-specific concepts related to coho salmon that have been identified by the Department's Classroom Aquarium Education Coordination Project to correlate with California Science Standards: physical/behavioral adaptations that affect survival (Life Science grade 3); food webs with producers/consumers (Life Science grade 4); physiology and organ systems (Life Science grade 5); ecology (Life Science grade 6); cell biology, genetics, and evolution (Life Science grade 7); and chemistry (Life Science grade 8). Educational material for use in schools may also include a teacher's information packet listing sources of information and knowledge about the coho salmon recovery process in California.

#### 5.3.2.2 Interpretive Media

The Department may prepare brochures targeted at specific audiences and containing pertinent coho salmon recovery information. Potential target audiences include landowners, consumers of household products, legislators, educators, and watershed restoration groups. The brochures would be made available at appropriate information centers such as public libraries and watershed group headquarters, and in association with suitable outreach efforts such as public appearances or Department demonstrations.

Depending on availability of resources, the Department may prepare a coho salmon recovery video containing a synopsis of the California coho salmon listing history, threats to survival, recovery efforts, and useful contacts. The videotape could be used as a media tool of a range-wide coho salmon public relations campaign and in association with local outreach efforts.

Department grant funds support public educational interpretive exhibits. For example, the development of a comprehensive education and interpretive plan for the Warm Springs Dam and Don Clausen Fish Hatchery describes the management history and restoration/recovery efforts with the Russian River watershed. The work funded under this proposal comprises Phase I of a larger project. Phase II (design, fabrication and installation of the exhibits developed in phase I) will commence if/when funding through the Department grant program has been secured.

## 5.4 ASSESSMENT, MONITORING, AND RESEARCH

The Recovery Strategy consists of a series of prioritized actions designed to restore coho salmon to their former range at appropriate abundance levels. The coho salmon monitoring program is a framework to: a) track the performance of coho salmon recovery efforts, and b) evaluate the condition of coho salmon populations, habitats and the effects of human activities on them. Both physical and biological elements will be monitored to track the status and trends of fish populations and habitats.

### 5.4.1 PROGRAM FRAMEWORK

A monitoring program framework will be established and will include the following elements, which are briefly described below. Each is essential for the effective implementation, long-term maintenance, and dependability of a monitoring program.[2]

#### 5.4.1.1 Scientific Planning and Prioritization

Careful and deliberate planning must be the foundation for a monitoring program. The Department and cooperating agencies and organizations have been developing some key components of anadromous salmonid monitoring, including recovery activity implementation and effectiveness, validation, and coastal population monitoring. The monitoring program should be established to ensure an effective and efficient program. Because there are many factors that are in need of monitoring, prioritization is also an essential element requiring early attention.

[2] Based, in part, on the CALFED Science Program's Comprehensive Monitoring, Assessment, and Research Program (2000)

The following components will be established and implemented through the planning and prioritization process:

1. Selection of appropriate metrics;
2. Determination of minimum data sets required to describe baseline conditions;
3. Selection of regional areas and independent populations for monitoring;
4. Development of sampling frameworks and sampling design;
5. Independent scientific review;
6. Standardized monitoring protocols;
7. Preparation and distribution of written protocols; and
8. Training and quality control for monitoring protocols.

The many variables in need of assessment, monitoring, and research (outlined in Table 5-1) will be evaluated and assessed at various spatial and temporal levels to determine the priorities for monitoring. It is likely that some priorities will differ by ESU, watershed, and local levels as well as over the time of coho salmon recovery (see below).

#### 5.4.1.2 Evaluating Current Monitoring

Along with establishing the monitoring framework and scientific protocols, current monitoring efforts will be evaluated for their applicability to coho salmon recovery. Local and regional monitoring efforts already exist. The role and utility of these efforts should be acknowledged, and monitoring efforts beneficial to an overall monitoring program should be integrated. In addition, an inventory is an effective process for identifying the scope and focus of ongoing efforts, the gaps in coverage and data, and differences and applicability of ongoing efforts based on differing objectives of each monitoring effort. Information from historical, baseline, and real-time monitoring will be necessary, especially for establishing the foundation for habitat and population status and trend monitoring.

#### 5.4.1.3 Data Management

Because coho salmon exist without regard to political or property lines, it is important to obtain data about coho salmon and their habitat from both public and private lands. The Department's ability to collect data from private lands is limited in many circumstances by a policy requiring landowner consent (FGC §857). Such consent is often withheld from the Department because of landowner concerns about confidentiality and the risk that if site-specific information is publicly disclosed, it will be misused or misinterpreted by others. A policy regarding data collection and disclosure that addresses these concerns would aid the Department's ability to protect and recover coho salmon. Such a policy is particularly important in that approximately 46% of the land in the SONCC Coho ESU and 86% of the land in the CCC Coho ESU that is privately owned.

The management of monitoring information will be essential. It will require dedicated effort and staff to house, compile, and distribute information to responsible and affected organizations and individuals. Important components to data management will be quality control, assessment, and appropriate application of the monitoring information. Assurances of confidentiality and use, and data reliability, will be important considerations for data management.

#### 5.4.1.4 New Research

There are many uncertainties concerning coho salmon recovery. Evaluation of previous and ongoing assessments and monitoring will not only identify future assessment and monitoring needs, but will also indicate issues and uncertainties that require research. These issues will need to be prioritized. Research into coho salmon biology and ecology, and land use practices

**TABLE 5-1:** Partial outline of potential ecological and land management variables for coho salmon recovery strategy assessment, monitoring, and research

I. **HYDRODYNAMICS AND SEDIMENT TRANSPORT**

II. **SYSTEM PRODUCTIVITY**
- A. PRIMARY PRODUCTIVITY
- B. INVERTEBRATE
- C. FISH
- D. NUTRIENT CYCLING

III. **FLUVIAL GEOMORPHOLOGY**
- A. SEDIMENT (embeddedness, suspended)
- B. TURBIDITY
- C. SUBSTRATE PARTICLE SIZE
- D. LWD CYCLING
- E. LAND SLIDING AND DEBRIS FLOW

IV. **HYDROLOGY**
- A. FLOW (rate, timing, quantity)
- B. TEMPERATURE
- C. OTHER WATER QUALITY (i.e., DO)

V. **ECOLOGICAL COMMUNITIES**
- A. RIPARIAN COMMUNITY
  1. Vegetation composition
  2. Invertebrate composition
  3. Vegetation condition
  4. LWD recruitment
- B. NEARSHORE OCEAN CONDITION
- C. ESTUARINE
  1. Condition
  2. Fish use

VI. **WATER USE**
- A. EFFICIENCY
- B. TRANSFER
- C. STORAGE

VII. **LAND USE**
- A. EFFECTS ON HABITAT
- B. EFFECTS ON FISH
- C. LAND USE CHANGE TRAJECTORIES
- D. ECONOMIC CONSIDERATIONS
  1. Land use and owners
  2. Local jurisdictions

VIII. **FISHING**

IX. **BARRIERS TO MIGRATION**

X. **FISH POPULATION**
- A. RANGE
- B. DISTRIBUTION
- C. COHORT REPLACEMENT
- D. ABUNDANCE
- E. FISH HEALTH

XI. **RECOVERY EFFORTS**
- A. IMPLEMENTATION
- B. EFFECTIVENESS
- C. VALIDITY (fish response)

XII. **COHO SALMON ECOLOGY**
- A. DISEASE
- B. COMPETITION
- C. GENETICS

XIII. **POLLUTANTS (TYPE AND SOURCE)**

and environmental effects on coho salmon and habitat, will aid the Department in revising and refining both the monitoring program and overall recovery goals.

#### 5.4.1.5 Program Reporting

The Recovery Strategy's monitoring program will have a reporting component by which the general public, landowners, local watershed groups, counties, government agencies, and State legislature can know the status and trend of coho salmon and the results of recovery activities.

Confidence regarding the validity and utility of information resulting from monitoring and research is essential to scientific credibility, public participation, and success in coho salmon recovery. The results and progress of the monitoring program will be subject to scientific review.

### 5.4.2 ASSESSMENT

In several watersheds, different types and levels of assessment have been done or are ongoing. In many other areas within the range of coho salmon, status information is sparse to non-existent. To evaluate the condition of fish populations, habitat condition, effects from land activity, effects of natural phenomena, and results of recovery efforts, an assessment of these conditions must occur prior to commencing a monitoring program. Baseline information will allow for comparison against changes over the time during the implementation of recovery activities. A baseline condition also will allow for evaluating trend and status. The monitoring program will evaluate historic and current information, identify gaps, and develop a strategy for assessing various conditions in the watersheds. Assessment needs will be prioritized.

### 5.4.3 MONITORING

The monitoring program for coho salmon will focus on two essential elements: 1) the status and trend of coho salmon and habitat, and 2) the performance of coho salmon recovery efforts. Monitoring will require a long-term commitment as well as annual collection of data on the fish populations, habitat condition, and physical and biological response to recovery actions intended to conserve and restore coho salmon populations and the habitats upon which they depend. An important component to the strategy to establishing a comprehensive monitoring program is to develop and implement standardized, robust field protocols. Monitoring can be divided into several categories, including:

- *Performance measures*. Performance measures are metrics used to track and measure progress of programmatic efforts relative to their goals on an annual basis. Performance measures, if consistently utilized, will begin to identify the long term trends needed to determine the ecological effectiveness of the program and will help ensure that resources are targeted and spent wisely.
- *Trend monitoring*. Trend monitoring evaluates how environmental conditions or populations change over time. The focus of trend monitoring is generally broad in scope, such as an entire ESU or species or extensive, geographic area, such as a large watershed or basin.
- *Implementation monitoring*. Implementation monitoring serves to document what recovery actions are taken and to evaluate whether those recovery actions are being implemented as planned. For habitat restoration, implementation monitoring provides baseline information before and immediately after a project occurs.
- *Effectiveness monitoring*. Effectiveness monitoring evaluates the effects of recovery actions, specifically if the recovery activities are having the desired effects.

This is largely a measure of physical responses to habitat restoration treatments and fisheries management actions. Response should be assessed against pre-established effectiveness criteria and evaluated with respect to the degree which they are obtained.

- *Validation monitoring*. Validation monitoring evaluates how a population, species, or biotic community responds to recovery actions. In the context of the Recovery Strategy, the focus will be on the response of coho salmon at stream reach, watershed, and ESU levels and will focus on each life-stage.

#### 5.4.3.1 Three-tiered Monitoring Framework

Any monitoring program must be able to evaluate conditions at various scales and allow those involved (i.e., State and Federal agencies, counties, watershed organizations, landowners) to participate. In addition, the monitoring itself and the results and information generated must be defensible both scientifically and legally and must be acceptable to the counties and local communities where coho salmon occur. This will require good data on the distribution, abundance, and population health of coho salmon throughout California. A significant monitoring effort sustained over several decades will be required.

The State of Oregon has demonstrated that such a monitoring effort can be successfully initiated through the Oregon Plan for Salmon and Watersheds (Oregon Plan), which includes a three-tiered system for estimating the abundance of adult salmon in coastal watersheds. It also includes targeted studies of juvenile abundances and habitat. In the 1990s, Oregon developed a specific monitoring approach based on stratified random sampling; this method was much more accurate than previous methods based on "index reaches," and is being used to monitor coho salmon. Oregon has thus demonstrated that a statistically rigorous monitoring approach is possible. The benefit of such an approach is that it delivers unbiased estimates of trends and abundance in salmonid stocks.

The *Oregon Plan* three-tiered framework:

**Tier I** is a broad-scale (i.e., ESU) assessment of ecosystem health. The intent is for data from Tier I to be used to stratify sampling at the more-detailed Tier II level. Tier I would probably require surveys at a frequency of once every 5 years for each sampling site. Candidate indicators to be measured are:

- *Biological attributes*. Fish presence/absence, distribution, percent of habitat occupied, genetic composition, invertebrate community health (the ones coho salmon need), habitat condition and key habitat elements (spawning and nursery areas, riparian condition).
- *Environmental attributes*. Geology/soils, land cover, digital elevation models, sedimentation/suspended sediment, water temperature, flow, and supply, and LWD recruitment.
- *Threat/Impact attributes*. Land use, roads, stochastic events (e.g., ocean conditions, drought), and barriers to migration.

**Tier II** is the level at which the status and trends in coho salmon population health are carried out. Annual measures of abundance would be based on a spatially-balanced random-sampling plan. Preliminary data to be collected are:

- *Adults*. Adults, spawners, redds, age structure, sex, hatchery fraction;
- *Juveniles*. Instream or emigrating, age/size class, fish condition; and
- *Habitat*. Macroinvertebrates, fish assemblage, DO, pH, nutrients/pollutants, solids, metals/toxins, temperature, channel form, valley form, valley width, geomorphic channel, channel substrate, canopy cover, LWD, riparian vegetation, land use and land cover, diversions, erosion processes, channel modification, and instream flow.

Data from Tier II would ideally be used as a control for Tier III data, which measures response of environmental conditions and salmonid populations to habitat restoration and other recovery actions (effectiveness and validation monitoring). The overall design of the Tier II portion of the coho salmon recovery plan could be modeled on Oregon's rotating panel design, which distributes sampling effort in time and space in a way that is intended to optimize the dataset's utility for detecting trends and status. It is also possible that a nested hierarchy of basin sampling and subsampling may be desirable.

**Tier III** is monitoring carried out for individual restoration projects and for a suite of related restoration treatments. It is used to assess and evaluate the effectiveness of restoration actions. The resulting information may then be assessed using comparisons with baseline and/or reference data collected in Tier II.



#### 5.4.3.2 Monitoring of Coho Salmon

To understand the current and potential future condition of coho salmon populations and habitat, there are certain, specific monitoring elements that will be the foundation to the overall monitoring program. These elements will be coordinated with local monitoring efforts and integrated with each other, and will span the entire range and distribution of coho salmon. Status and trend monitoring, implementation and effectiveness monitoring of recovery efforts, and validation monitoring of coho salmon response constitute the core of the State's coho salmon monitoring program. Conceptual models likely will be developed and utilized in the monitoring.

*Status and Trend Monitoring*. The first essential monitoring requirement for coho salmon will be to understand the status and trend, primarily at the ESU level. To do this, establishing the baseline condition of coho salmon populations and habitat and ongoing monitoring of coho salmon populations will be necessary. This monitoring information will be directly tied to the Department's ability to recommend downlisting, uplisting, or delisting of either ESU.

In 2003, the Department and cooperating agencies began to develop a coastal salmonid monitoring plan. The objective of the plan is to develop statistical sampling designs to estimate status and trends in coastal California salmonid population and habitat conditions at the ESU or other appropriate spatial scale. This plan will be the foundation for population status and trend monitoring for coho salmon.

*Implementation and Effectiveness Monitoring*. Local and regional restoration activities will be the core to coho salmon recovery efforts. Tracking, measuring, and understanding these activities will be critical to making wise use of limited resources and time and in making improvements in recovery and restoration actions based on past results.

In 2001, through the FRGP, efforts began the Coastal Salmonid Restoration Monitoring and Evaluation Program (CSRMEP). CSRMEP is developing implementation and effectiveness

monitoring protocols to evaluate restoration efforts with the goal of improving and conserving coastal anadromous salmonid habitat. Components of this effort currently underway will:

a. Complete monitoring protocol development;
b. Field-test all protocols;
c. Complete a data management support system;
d. Provide training in protocol usage; and
e. Begin testing the implementation of a comprehensive restoration effectiveness monitoring program.

*Validation Monitoring.* Validation monitoring evaluates whether and to what degree a specific practice accomplishes goals and objectives. In addition, validation monitoring is invaluable for verifying hypotheses regarding coho salmon ecology and recovery, and conceptual models predicting the relationship between different ecological and land management variables. Validation monitoring is indispensable in determining the success of "...actions taken in an attempt to improve the status of salmon (or a specific stock of salmon)..." (Botkin et. al. 2000).

Starting in 2002, the FRGP began to develop validation monitoring protocols for anadromous salmonid recovery activities in California. The goal is to develop standardized validation monitoring protocols to assess and evaluate the response of salmon and steelhead to restoration and management efforts aimed at conserving and restoring anadromous salmonids in coastal California watersheds. These validation monitoring protocols will serve as the foundation for coho salmon Recovery Strategy validation monitoring. It is anticipated that protocols will be developed and ready for field testing by 2005.

### 5.4.4 NEW RESEARCH

Evaluation of previous and ongoing assessments and monitoring will not only identify future coho salmon assessment and monitoring, it will also indicate biological issues and uncertainties that require research. Like assessment and monitoring needs, coho salmon research will need to be prioritized. Future research into the biology of coho salmon (e.g., genetics, estuary use), effects of land use practices (e.g., urbanization, forestry) and environmental processes (e.g., climatic variation in ocean condition, woody debris cycling) on coho salmon populations and habitat will aid the Department in revising and refining both the monitoring program and overall recovery goals. The CRT identified some priority research issues, and the Department in collaboration with the recovery teams, will continue to identify and prioritize research needs.

### 5.4.5 ASSESSMENT, MONITORING, AND RESEARCH RECOMMENDATIONS

Assessment, monitoring, and research are important to coho salmon recovery. Recommendations for range-wide monitoring, research and assessment that will contribute to recovery of coho salmon are set forth in the range-wide implementation schedule in Chapter 9.

## 5.5 REGULATORY ROLE IN RECOVERY

Improving implementation and enforcement of existing laws and regulations (Table 5-2) by and among various State, Federal, and local governments can contribute significantly to the recovery of coho salmon. This was recognized by the CRT. Therefore, many recovery actions call for improved implementation and/or enforcement of specific laws and regulations. Other recovery actions call for improved coordination among government agencies in implementing, enforcing, and streamlining the permit processes to promote activities that will benefit coho salmon.

**TABLE 5-2:** Existing laws, regulations, and permits that contribute to coho salmon recovery

**STATE LAWS AND REGULATIONS**

| LAWS AND REGULATIONS | GENERAL DESCRIPTION[a] |
|---|---|
| Recovery Strategy Pilot Program, Fish & Game Code §2105 *et seq.* | Sets forth requirements for Recovery Strategy.<br>Sets forth criteria for Commission approval of Recovery Strategy.<br>Authorizes inclusion of guidelines for issuance of memoranda of understanding under FGC §2081.<br>Provides that the Recovery Strategy itself shall have no regulatory significance, shall not be considered to be a regulation for any purpose, and is not a regulatory action or document. |
| Fully Protected Species, Fish & Game Code §3511, 4700, 5050, 5515. | Prohibits take and possession of specified fully protected species, except collecting for "necessary scientific research" as authorized by the Commission.<br>No provision of the FGC or any other provision of law shall be construed to authorize the issuance of permits or licenses to take any fully protected species. |
| California Endangered Species Act (CESA), Fish & Game Code §2080 *et seq.* | Prohibits take of California-listed and candidate species, except as otherwise authorized. |
| Natural Community Conservation Planning Act, Fish & Game Code §2080 *et seq.* | Authorizes take of any species whose conservation and management is provided for in an approved natural community conservation plan. |
| Lake and Streambed Alteration Protection, Fish & Game Code §1600 *et seq.* | Prohibits any person from substantially diverting or obstructing the natural flow, or substantially changing the bed, bank, or channel of any river, stream or lake without first notifying the Department of the activity.<br>Prohibits a person from commencing any activity until:<br>1. The Department has found that it will not substantially adversely affect existing fish and wildlife resources; or<br>2. The Department's proposals as to measures necessary to protect fish and wildlife resources (as agreed to), or the decision of a panel of arbitrators, have been incorporated into the activity.<br>Where the Department has found the activity will substantially adversely affect existing fish and wildlife resources, prohibits any person from engaging in the activity unless it is conducted in accordance with the department's proposals (as agreed to) or the decisions of the panel of arbitrators. The Department shall not condition a streambed alteration agreement on the receipt of another State or Federal permit. |
| Water Pollution, Fish & Game Code §5650. | Prohibits anyone from depositing in, permitting to pass into, or placing where it can pass into the waters of the State, specified items and "any substance or material deleterious to fish, plant life, or bird life," except a discharge or release expressly authorized by and in compliance with a WAR or waiver or in compliance with a Federal permit issued a water quality certification issued by the State Water Resources Control Board or regional board after public hearing. |
| Commission Regulations, Fish & Game Code §316.5. | Authorizes Commission to "prohibit the taking or possessing of salmon in the same manner as the taking or possessing of salmon is prohibited by Federal law or by rules or regulations adopted by the United States Secretary of Commerce, notwithstanding any other provision of this code." |
| Examination of Dams, Fish & Game Code §5930. | Requires the Department, from time to time, to examine all dams in all rivers and streams in the State naturally frequented by fish. |
| Fishways, Fish & Game Code §5931. | Provides that if, in the opinion of the Commission, there is not free passage for fish over and around any dam, the Department shall cause to be furnished suitable fishway plans and order the owner in writing to provide the dam, which shall be completed to the Department's satisfaction. |
| Additional Fishways, Fish & Game Code §5932. | Requires that when article 2 (dams and structures) has been complied with, if in the opinion of the Commission changed conditions make additional structures desirable for free passage of fish, the Department may make such additional structures and necessary expenditures. |
| Dam Construction and Enlargement, Fish & Game Code §5933. | Requires the Commission to be given a copy of any application to DWR for new dam or enlargement of dam. If the Commission deems fishway necessary for preservation and protection of fish and construction and operation of fishway is practicable, it shall set a date for hearing. Where the Commission finds after hearing fishway is necessary and practicable, prohibits construction without prior written approval of Commission. |
| Fishway Maintenance, Fish & Game Code §5935. | Requires owner of any dam upon which a fishway has been provided shall keep the fishway in repair and free from obstructions to passage of fish at all times. |
| Fish Passage, Fish & Game Code §5937. | Requires owner of any dam to allow sufficient water at all times to pass through a fishway, or in the absence of a fishway, allow sufficient water to pass over, around, or through the dam, to keep in good condition any fish that may be planted or exist below the dam. |

*continued*

**TABLE 5-2:** Existing laws, regulations, and permits that contribute to coho salmon recovery (continued)

**STATE LAWS AND REGULATIONS** (continued)

| LAWS AND REGULATIONS | GENERAL DESCRIPTION[a] |
|---|---|
| Hatchery in Lieu of Fishway, Fish & Game Code §§5938, 5940, 5941. | Provides that when in the opinion of the Commission a fishway is impracticable, Commission may order owner of the dam to equip a hatchery to Department plans and specifications. After the hatchery is constructed, The Department shall operate it without further expense to dam owner. However, dam owner shall permit the use of free water for the hatchery. If dam generates electricity, the dam owner shall permit the use of free electricity for the hatchery. |
| Fish Planting in Lieu of Fishway, Fish & Game Code §5942. | Authorizes the Commission to order dam owner in lieu of fishway, hatchery, equipment to plant, under Department supervision, young of fish that naturally frequent waters of the stream or river, at such times, in such places, and in such numbers as the Commission may order. |
| Screening Diversions Deleterious to Salmon and Steelhead, Fish & Game Code §6100. | Requires dam owners to screen any new diversion of water from any stream having populations of salmon and steelhead which is determined by the Department to be deleterious to salmon and steelhead.<br>Authorizes the Department to make onsite investigation prior to proposing measures necessary to protect fishlife.<br>Prohibits commencement of diversion until the Department has determined the protective measures have been incorporated into plans and construction of diversion. |
| Suction Dredging, Fish & Game Code §5653 *et seq.* | Prohibits suction dredging in rivers, streams, and lakes of the State, except as authorized. |
| Z'Berg-Nejedly Forest Practice Act, Pub. Res. Code §4511 *et seq.* Forest Practice Rules, CCR Title 14, §895 *et seq.* | Regulates timber operations on industrial and non-industrial timberlands.<br>Sets forth requirements for timber operations and timber harvest plan review. |
| Surface Mining and Reclamation Act, Pub. Res.Code §2710 *et seq.* | Requires for all mining operations an approved reclamation plan and financial assurances to cover estimated reclamation costs. |
| Porter-Cologne Water Quality Control Act, Water Code §13000 *et seq.* | Requires persons proposing to discharge waste that could affect the waters of the State to file a Report of Waste Discharge with the appropriate Regional Water Quality Control Board. RWQCB will either issue a Waste Discharge Requirement or waive the requirement. |
| Streamflow Protection, Pub. Res. Code §10000 *et seq.* | Authorizes the Department to develop, review, and/or propose streamflow requirements or modifications to streamflow requirements, and initiate studies therefore. |
| California Environmental Quality Act, Pub. Res. Code §21000 *et seq.* | Requires environmental review and public disclosure of environmental impacts. |
| **FEDERAL LAWS AND REGULATIONS** | |
| Endangered Species Act, 16 U.S.C. §1531 *et seq.* | Prohibits take of ESA-listed species, except as authorized under the ESA. Take can be authorized through section 7 and section 10.<br>Section 7 requires Federal agencies to consult whenever any undertaken, permitted, or funded by a Federal agency will result in take of an endangered species or destruction of critical habitat. Section 7 results in an incidental take statement, allowing incidental take, subject to reasonable and prudent measures.<br>Section 10 provides for issuance of permits to persons authorizing incidental take. |
| U.S. Army Corps 404 Permit, Clean Water Act, 33 U.S.C. §1344. | Regulates discharge of dredged or filled material from a point source into the waters of the US, through:<br>1. General or individual permit, or<br>2. Letter of Permission issued by the US Army Corps of Engineers.<br>Exemptions under §404(f)(1) and 33 CFR §323.4 include normal farming, silviculture, ranching, certain construction or maintenance of farm roads or forest roads. |
| Section 10 Rivers and Harbors Act 33 U.S.C. §403. | Regulates work or structures in, or affecting, the course, condition, or capacity of navigable waters of the US through:<br>1. General or individual permit, or<br>2. Letter of Permission issued by the US Army Corps of Engineers. |
| Section 401 Water Quality Certification, Clean Water Act, 33 U.S.C. §1341. | Requires an applicant for a Federal license or permit to conduct any activity that may result in any discharge into navigable waters to provide the Federal licensing or permitting agency a certification or waiver of certification from the State in which the discharge originates or will originate that the discharge will meet the State's water quality standards.<br>Prohibits granting of any license or permit if the State denies certification. |
| TMDLs, CWA §303(d) 33 U.S.C. §1313. | Requires establishment of TMDLs for point sources and non-point sources for listed impaired water bodies. TMDLs are not enforceable, except through a State implementation plan (basin plan).<br>To date, the Garcia River TMDL is the only one that has been incorporated into a basin plan. |

*continued*

**TABLE 5-2:** Existing laws, regulations, and permits that contribute to coho salmon recovery (continued)

**FEDERAL LAWS AND REGULATIONS** (continued)

| LAWS AND REGULATIONS | GENERAL DESCRIPTION[a] |
|---|---|
| Fish and Wildlife Coordination Act, 16 U.S.C. §661 *et seq.* | Requires Federal agencies to consult with the Fish and Wildlife Service and State fish and game agencies before undertaking or approving projects that control or modify surface water projects. |
| Data Quality Act, Public Law 106-554. | Pursuant to the Data Quality Act, the Office of Management and Budget (OMB) issued guidelines to Federal agencies providing policy and procedure guidance for ensuring and maximizing the quality, objectivity, utility, and integrity of information (including statistical information) disseminated by Federal agencies. The guidelines require procedures for persons who may be affected by such information to request corrections to information that does not conform to the guidelines. OMB directed all Federal agencies to issue implementing guidelines. NOAA and FWS, among other Federal agencies have issued guidelines.<br>Both NOAA's and USFWS's guidelines include objectivity standards. These guidelines apply to third-party information (such as information from states) that the agencies use. The guidelines acknowledge and do not override other compelling interests such as privacy, trade secrets, intellectual property, and other confidentiality protections established by law. Where these considerations preclude full transparency, then "especially rigorous robustness checks" will be applied. |
| National Environmental Policy Act, 42 U.S.C. §4321 *et seq.* | Requires environmental review and public disclosure. |
| Santa Cruz County Riparian Corridor Protection Ordinance, County Code Chapter 16.30. | Defines, protects and determines boundaries of riparian corridors for permits and exemptions. |

**PLANS AND PERMITS PURSUANT TO STATE, FEDERAL AND LOCAL LAWS**

| PLANS AND PERMITS | GENERAL DESCRIPTION[a] |
|---|---|
| Pacific Lumber Company Habitat Conservation Plan | Provides mitigation that contributes to recovery of coho salmon. |
| Water Quality Control Plan for North Coast Region | Provides water quality standards for beneficial uses in North Coast Basin, including Garcia River TMDL. Prohibits unauthorized discharges in violation of the basin plan. |
| Water Quality Control Plan for San Francisco Bay Region | Provides water quality standards for beneficial uses in San Francisco Bay Region. Prohibits unauthorized discharges in violation of the basin plan. |
| Humboldt County, USACE Letter of Permission 96-1 for Gravel Mining and Excavation Activities Within Humboldt County | Authorizes gravel mining and excavation activities within Humboldt County subject to specified conditions. |
| Humboldt County Extraction Review Team (CHERT) | Independently reviews gravel mining and extraction plans and issues recommendations therefore. |
| Sonoma County Aggregate Resources Management | Authorizes gravel mining in Sonoma County, but defers to the Department concurrence of project conditions through the Streambed Alteration Agreement process under FGC §1600 *et seq.* |
| Del Norte, US Army Corps of Engineers Letter of Permission 96-2 for Gravel Mining and Excavation Activities within Del Norte County | Authorizes gravel mining and excavation activities within Del Norte County subject to specified conditions. |

[a] General descriptions are provided for convenience of the reader. The descriptions are not intended to be exhaustive. For details, the reader should refer to the actual statute, regulation, ordinance, and/or document itself, and any applicable case law.